

ABSTRACT OF THE DISCLOSURE

[164] A direct expansion geothermal heat exchange system including certain requisite heating/cooling load calculations, certain operational refrigerant pressures, refrigerant tubing design lengths in varying soils, refrigerant tubing sizing per ton of system design capacity, refrigerant tubing sizing at varying sub-surface installation depths, lowering refrigerant tubing into a borehole via rope, encasing the lower segment of refrigerant tubing within a solid encasement, providing a bar for rope attachment, using a winch to raise and lower refrigerant tubing, certain sizing of the compressor, certain air handler sizing, certain accumulator sizing, certain sizing of metering devices in the heating mode and in the cooling mode, parameters for charging the system, certain sizing of the receiver, utilizing certain grout for corrosion protection and for enhanced heat transfer, providing a fluid filled pipe within a borehole to contain accessible refrigerant tubing, providing a certain fluid fill for the pipe, one of providing a certain time delay on the low pressure cut off switch and of eliminating the switch, providing a certain oil separator return line location, and providing a certain amount of lubricating oil.